CHAPTER 5

RATE DESIGN, PARTICIPATION ESTIMATES, AND AVOIDED DEMAND RESPONSE PROGRAM COSTS

SCARLETT LIANG-UEJIO

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I. INTRODUCTION AND SUMMARY

This chapter presents the Division of Ratepayer Advocates' (DRA) analysis of San Diego Gas and Electric Company's (SDG&E) proposals and assumptions on rate design and participation rates[1] after the deployment of its Advanced Metering Infrastructure (AMI) project between 2009 and 2038. These assumptions form the basis for the demand response benefit estimates, which comprise a significant portion[2] of SDG&E's AMI benefits in its business case in this proceeding.[3] DRA's analysis has led to the conclusion that SDG&E's proposed and illustrative rate designs and participation rates are unrealistic.

In summary, DRA makes the following comments and recommendations:

1. If the Commission assumes that SDG&E's customers would only have a "carrots" and no "sticks"[4] type of program like the Peak Time Rebate (PTR) program for the entire forecast horizon, the participation rates and demand response benefits would be much lower than SDG&E's forecast.

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[1] SDG&E's proposed and illustrative rate design and participation estimates are discussed in Chapters 5, 6, and 14 of its amended testimony filed on July 14, 2006 (hereinafter referred to as "July amended testimony").

[2] SDG&E estimated a total demand response benefit of $262 million (present value, 2006$). This amount is about 33 percent of the total benefits in its AMI business case (see Table EF 2-1 in Chapter 2 of SDG&E's July amended testimony).

[3] In DRA's Chapter 4, DRA uses the recommendations on rate design and participation rates presented in this chapter to run the elasticity model to calculate DRA's estimated demand response benefits for SDG&E's AMI business case (DRA's Chapter 1). It should be noted that as discussed in DRA's Chapter 1, DRA's recommended AMI business case is based on an AMI product cycle of 17 years (2007-2024) as opposed to the 32 year cycle (2006-2038) used by SDG&E. Accordingly, DRA's recommendations on rate design and participation rates are for 2009 to 2026 (a full 17-year cycle) as opposed to the 2009 to 2038 period used by SDG&E.

[4] In the context of rate design, "carrots" mean an incentive credit for energy reduction or a lower rate for off-peak usage. "Sticks" means a higher rate or an additional surcharge for peak periods.

2. It is unreasonable to assume, as SDG&E does, that the Commission would eliminate the current Time of Use (TOU) rate option for medium and large commercial and industrial (C&I) customers and authorize only one default Critical Peak Pricing (CPP) rate (regardless of its design) after the AMI deployment.

3. SDG&E's participation rates, as shown in Table 5-1 below for residential, medium and large C&I customers, are unrealistically high.[5]

4. PTR and CPP rate design should be litigated in SDG&E's next Rate Design Window proceeding. For the purpose of this AMI business case, the Commission should adopt DRA's recommended participation rates and rate design assumptions as shown in Tables 5-2 and 5-3 below.

5. The avoided demand response program costs and the adjustment to the demand response (in megawatt or MW) should be reflected in the AMI business case on a consistent basis. That is, if the MW adjustment for these programs is based on actual performance as SDG&E did, the avoided costs should also reflect the recorded amounts instead of the authorized budget.

II. RESIDENTIAL RATE DESIGN AND PARTICIPATION RATES

A. Summary

In this proceeding, SDG&E requests that the Commission approve its proposed Peak Time Rebate (PTR) program for residential customers in concept, and has included $123.2 million[6] of PTR related demand response benefits in its AMI business case. Under the PTR, SDG&E proposes a rebate credit of $0.65/kWh for a customer's peak usage below the customer's baseline during a Demand Response (DR) event.[7] SDG&E proposes to implement the PTR in 2009, and the program details would be further refined and approved in its next demand response

[5] Except for the programmable/controllable thermostat (PCT) populations among the small and medium C&I customers.

[6] Present value in 2006$ (see Table SSG 6-3 in Chapter 6 of SDG&E's July amended testimony).

[7] SDG&E's July amended testimony, Chapter 5, p. MFG-15, lines 9-12.

proceeding.[8] In its business case, SDG&E assumes its proposed PTR program will be the only dynamic pricing program offered to residential customers between 2009 and 2038.[9]

SDG&E's PTR is similar to the statewide 20/20 program in certain respects. Both programs use a baseline methodology, though the definitions of a baseline are different. Both programs have only "carrots" and no "sticks," and thereby are intended to maximize participation without incurring significant recruitment costs. However, recently published research shows that the 20/20 program was not cost-effective, was expensive, and attracted a much smaller percentage of active participants than policymakers had anticipated.[10] SDG&E's PTR program is likely to face the same problems.

SDG&E argues in favor of its PTR program on the basis that it has "carrots" and no "sticks," and believes it could maximize participation and demand response.[11] Because of the 20/20 experience, DRA carefully examined SDG&E's PTR proposal to determine whether it makes sense for SDG&E to have another incentive-based ("carrots" only) program. DRA especially focused on SDG&E's baseline methodology to determine whether the PTR faces similar issues as does the 20/20 program. Based on its findings, DRA has serious concerns about any approach that requires using a baseline. Taking these problems into consideration leads to

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[8] Based on SDG&E's representation in a conference call with DRA on May 3, 2006, though SDG&E did not state it explicitly in its July amended testimony.

[9] As shown in SDG&E's July amended testimony, Table SSG 6-1. While SDG&E's estimates of demand response benefits for PTR could be regarded as a proxy for a default CPP program, SDG&E does not characterize its demand response estimates in this manner.

[10] "Evaluation of the California Statewide 20/20 Demand Response Reduction Programs" prepared by Wirtshafter Associates, Inc. on June 6, 2006. This report shows the total cost per kW saved from the statewide 20/20 program is $3,642, 43 times higher than SDG&E's proposed avoided capacity value. The evaluation results indicated "that the program is not cost-effective and should not be continued."(p. xi)

[11] SDG&E's July amended testimony, Chapter 5, p. MFG-15 and MFG-16. SDG&E's Errata revised its June Supplemental Testimony (June Errata), p. 21, lines 10-14. SDG&E PowerPoint presentation on its PTR baseline study at the conference meeting with DRA and CEC on May 5, 2006 (referred as "SDG&E's PTR Presentation" herein).

significantly reduced participation rates, and ultimately reduced demand response benefits, relative to those estimated by SDG&E.

Another rate design approach is CPP rate design, which does not require any baseline and entails both "carrots" and "sticks."[12] A voluntary CPP program would significantly reduce participation rates and demand response benefits. Without changing their usage patterns, the high peak users will face bill increases. These customers would not opt into CPP. Ironically, that portion of the population whose consumption profile shows the largest increase during peak periods may be the population least interested in opting-into a CPP tariff. Additionally, as stated in SDG&E's June Errata,[13] there are additional recruitment costs for a voluntary CPP rate.[14] It is clear, therefore, that a voluntary CPP rate design has drawbacks. DRA, however, does not support a default CPP rate because of potential adverse bill impacts.[15]

DRA's analysis of residential rate design examines three scenarios: Case A, Case B, and Case C. Case A is an analysis of SDG&E' PTR proposal and is the primary focus in this chapter. Case B is an analysis of SDG&E's adaptation of PG&E's voluntary CPP rate design (PG&E style). Case C is an alternative rate design scenario explored by SDG&E, where PTR is applied until AB 1X expires, and a default CPP rate is imposed.[16] Table 5-4 below provides a summary of the estimated demand response benefits under the three scenarios. No matter which rate design scenario is applied to this AMI project, DRA concludes that the demand

[12] A typical CPP rate could be a much higher CPP charge overlaid on top of a customer's existing tiered and TOU rates or a new TOU rate.

[13] SDG&E's June Errata filed on June 21, 2006 revised its Supplemental Testimony filed on June 16, 2005.

[14] p. 21.

[15] Furthermore, it is DRA's position that AB1X precludes approval of CPP rates for residential customers on a default basis, for the first 130% of their baseline usage, until AB1X sunsets. This legal issue is, however, outside the scope of this testimony.

[16] SDG&E's June Errata, p. 18, lines 14-18.

response benefits are significantly lower than SDG&E's estimates, and would not help SDG&E's business case become cost-effective.[17]

B. The Peak Time Rebate (PTR) Approach (Case A)

1. Baseline Definition and Participation Rate

The main problem with the PTR approach is defining the "PTR baseline.[18]" Though SDG&E's July amended testimony leaves unspecified how the PTR baseline would be defined,[19] SDG&E's March testimony favored using an average of the five previous eligible non-event days. Under that definition, the baseline would be, for the average SDG&E residential customer, 15%[20] lower than the customer's average peak usage on the Demand Response (DR) event day. Thus the average customer would have to reduce usage a full 15% before being paid *any* rebate. Given that the average critical peak day demand reduction in the Statewide Pricing Pilot (SPP) elasticity model was 11.4%,[21] it is clear that the average customer will have no incentive to reduce load on those days. Logically, those customers would not participate in the program, so DRA regards them as non-participants. As shown in Figure 5-1, about 31%[22] of the residential population are structurally non-participants, leaving 69% as potential participants.[23] Considering that SDG&E expects that 70% of the residential customers will be made aware of the PTR program, DRA calculated the participation rate to be 50%,[24] 20% lower than SDG&E's participation rate.[25]

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[17] The cost-effectiveness of SDG&E's AMI business case is discussed in DRA's Chapter 1.

[18] A baseline is used to determine the reduced energy usage that becomes eligible for the incentive payment.

[19] See footnote five on page MFG-15.

[20] 14.32% as shown in SDG&E's baseline study (DRA Data Request No. ORA-020). DRA rounded it to 15%.

[21] SDG&E's July amended testimony, Chapter 6, p. SG-22, line 5.

[22] About 357,000 customers.

[23] Results of DRA analysis using SDG&E's 2004 load research data for the PTR baseline study.

[24] 50% = 70% x 68% (with rounding).

[25] SDG&E assumed that the full 70% of the population who are aware of the program would be participants.

This resulted in a demand response benefit of $87 million[26] in contrast to SDG&E's estimate of $123.2 million, a reduction of $36 million (29%).

Since its March filing, SDG&E conducted a PTR baseline study and has been aware of this PTR baseline problem. In its response to DRA's data request, SDG&E agreed with DRA that the five-day baseline definition would lower the number of participants.[27] SDG&E's baseline study showed an annual bill saving ranging from [redacted] over 13 DR events.[28] SDG&E's recent study shows that customers would need savings "at least 10% and possibly as much as 25% each month on electricity to make adjusting their usage behavior worthwhile."[29] This further supports DRA's conclusion that SDG&E's participation rate of 70% is unrealistic. If those who would receive less than 25% savings were counted as non-participants, the participation rates would be even lower.[30]

2. "Structural Benefitors"

Another problem of using a five-day baseline definition is that about 28% of the population[31] are so called "structural benefitors." These are customers who would receive a rebate payment for doing nothing during a peak time event. This occurs randomly due to the nature of a peak event and customer's activities on a peak day. For example, a peak event might occur on the day that a customer starts a vacation. Though SDG&E did not include any rebate payment as a cost in its AMI

[26] Present value (2009-20038) and based on SDG&E's avoided capacity value of $85/kW-year. If DRA's avoided capacity value of $52/kW-year and a 17-year AMI life cycle were used, the value is $38 million (see Table 5-2).

[27] See Attachment 5-2, SDG&E's Response to DRA's Data Request No 30.

[28] As shown in SDG&E's PTR presentation. The monthly bill savings vary depending on the number of DR events in a given month. Note, this low bill savings is somewhat overstated and does not reflect the fact that 31% of the customers receive no rebates.

[29] SDG&E's AMI Focus Group Study, November 2005 by Orsino Marketing Research, p.9.

[30] About 41% of the population (478,000) has to reduce 1% to 15% peak usage in a DR event before seeing any bill savings.

[31] About 356,000 customers.

business case, SDG&E showed that [redacted] million of the revenues would be paid to reduce these customers' summer bills for doing absolutely nothing.[32] This amount is even greater than the $6.2 million[33] paid to the customers who make an effort to reduce their peak usage by 11.4% or more.

An extreme example of a structural benefitor problem is evident in the "20/20 Rebate Program." The research on that "carrot only" financial incentive program showed that 79% of the energy reduction that qualified customers for the 20% rebate came from the households that were so called "free-riders" and "inactive customers."[34] Albeit to a lesser extent, there is the probability that the PTR tariff would exhibit similar inefficiencies.

3. Alternative Baselines

DRA has discussed the baseline problem with SDG&E to explore possible solutions.[35] However, DRA finds none of these possible solutions satisfactory, and discusses them here merely for illustrative purposes. One could alleviate the baseline problem, for example, by defining the PTR baseline as the customer's five previous eligible non-event days multiplied by 1.15. This adjustment is to line up the baseline with the average peak usage. It would ensure that on an average basis, customers would get a full incentive payment for 100% of the peak energy that they reduce. While this solves the problem for the average customer, multiplying the baseline by 1.15 creates a potential windfall for customers whose differential between the PTR baseline and CPP usage prior to the adjustment was less than 15%. With the 1.15 adjustment, an additional 42% of the population will fall into the so called "structural

[32] SDG&E PowerPoint presentation at the conference meeting with DRA and CEC on May 5, 2006.

[33] $6.2 million = 105 MW x 91 CPP hours x $0.65/kWh x 1,000. The 105 MW load reduction is shown in SDG&E's Table SSG 6-4.

[34] "Evaluation of the California Statewide 20/20 Demand Response Reduction Programs" prepared by Wirtshafter Associates, Inc. on June 6, 2006, p. vi.

[35] SDG&E has also examined various alternative baseline methodologies trying to minimize this problem. To date, DRA is not aware of other alternatives that SDG&E has come up with that would solve the problem.

benefitor" category who wouldn't have received any incentive payment otherwise. This alternative would increase the total revenue to the "structural benefitors" by [redacted] million (70%)[36] of revenues paid to reduce these customers' summer bills for doing nothing.

Another way to address this problem is to increase the rebate level (on a per kWh basis) instead of adjusting the PTR baseline by 1.15. The intention of doing so would be to compensate for the fact that the average customer (who reduces load by 11.4%) would receive no rebate for that reduction. But clearly one might have to increase the rebate significantly to get the average customer to reduce their load by more than 15% given that a 16% reduction would only lead to rebate on 1% of that reduction. This approach might significantly compound the potential windfall received by the structural benefitors. While many of the cost-benefit tests done from a total ratepayer viewpoint would regard this merely as a transfer payment,[37] it is one that clearly has major equity problems that cannot be disregarded using this kind of thinking.

C. CPP Rate Design (Case B and Case C)

In response to the Administrative Law Judge's (ALJ) ruling dated May 19, 2006, SDG&E filed its June Errata that includes an analysis on SDG&E's adaptation of PG&E's voluntary CPP rate design, which is designed to target PG&E's large customers with central air conditioning (CAC).[38] Though SDG&E does not recommend such rate design for its residential customers; it provided an estimate for the demand response benefits from the PG&E style CPP rate design.[39] DRA's analysis below should not be interpreted as an endorsement of this rate design.

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[36] SDG&E's response to DRA's Data Request No 20, Q.2.

[37] As in SDG&E's AMI business case.

[38] As shown in Table 1 of SDG&E's June Errata. In its response to DRA Data Request No. 40, SDG&E updated all tables in its June Errata.

[39] See updated Table 12 of SDG&E's June Errata (as shown in SDG&E's response to DRA Data Request No. 40).

Rather, it is an analysis of the potential demand response benefits that could be achieved were this rate design applied.

A voluntary CPP rate design has many of the same problems as a PTR program. Revenue neutral CPP rate design is done based on an average usage pattern and has a high CPP rate. It is clear that the customers with below-average usage patterns (e.g., those without central air conditioning or non-CAC) would be the structural benefitors and the other group (e.g., those with CAC) would be the losers. Those customers with high peak usage patterns will likely see bill increases under a CPP rate design unless they reduce their peak usage substantially.[40]

Though the structural benefitors under a PTR rate design using a baseline are random, it is likely that the structural benefitors under both approaches are the flat load customers who do not have a large potential for peak load reduction. Table 5-5 shows that, on a percentage basis, structural benefitors under PTR tend to be the smaller customers, whereas the non-participants are larger customers. 49% of SDG&E's residential customers in the Inland climate zone and 26% in the Coastal zone have central air conditioning;[41] CAC customers comprise a total of 36%[42] of SDG&E's residential population. In fact, air conditioning customers have larger and more variable load patterns; and use more peak energy. This could account for them being more likely to not benefit from PTR. Table 5-5 also shows that the average peak usage of PTR structural benefitors is lower than the non-participants' average peak usage in the same usage group.[43] The percentage (31%) of PTR non-

[40] The Residential Automated Demand Response System (ADRS) Pilot results indicate that customers with enabling technology can achieve significant load reductions during Super Peak days (SDG&E's Report, October 31, 2005).

[41] SDG&E July amended testimony, Chapter 6, page SG-19, line 3.

[42] Derived from SDG&E's workpaper for Chapter 6 of July amended testimony.

[43] For example, the average structural benefitor with a monthly usage of 400 kWh or less uses [redacted] kWh of peak energy as compared to [redacted] kWh for the average non-participants in the same usage group.

participants is very close to the percent of CAC population (36%). This explains that both PTR and voluntary CPP have similar problems.[44]

One advantage of a CPP rate design is that the pattern of structural benefitors and those who receive no benefits is not confounded by random elements such as customers going on vacation at the right or wrong time. But, offsetting this advantage is the fact that a CPP tariff may entail higher recruiting costs because, unlike a PTR program, customers are not automatically enrolled and the existence of "sticks" is a disincentive to enrolling. Recruitment costs would be needed to encourage enrollment.

Because of these various problems, DRA makes no rate design recommendations in this proceeding. However, it does provide estimates of the demand response benefits under different rate design scenarios. A voluntary CPP rate patterned after the PG&E style CPP rate design would yield $28 million in benefits (Case B, see Table 5-4). If PTR was offered until AB 1X expires, and CPP became a default tariff after that, the demand response benefits would increase to $51 million in benefits (Case C, see Table 5-4). Both these scenarios are similar to ones that SDG&E presented in its June Errata but are adjusted for DRA's recommended PTR participation rate, forecast horizon, and capacity cost. Again, DRA does not support a default CPP rate design for residential customers, but only offers this evidence as a point of information.[45]

Table 5-4 provides a comparison of the three rate design cases discussed in this chapter.

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[44] DRA analyzed SDG&E's 2004 weather data. DRA found that on average, the peak event day temperature was 7 degree in Fahrenheit (°F) higher than the baseline day temperature. The highest difference in one peak event day was 23°F in the transitional climate zone (Mirimar Weather Station) between the Coastal and Inland zones. This further supports that the CAC customers who run air conditioning during the hottest peak event days will not benefit from either a PTR or CPP rate without reducing peak usage significantly.

[45] New Year Times, July 28, 2006, "In California, Heat is the Blamed for 100 Deaths." The timing is coincidental but DRA notes the extreme 2006 summer heat wave, which is a reminder that customers' health and safety must be accounted for in dynamic tariff design.

D. Different Approaches to the PTR Cost Effectiveness Evaluation

SDG&E applied a cost-benefit analysis of its entire AMI project, but did not make a separate cost-benefit analysis of the PTR program itself. The 20/20 report used a cost-effectiveness test from a program administrator view point, which regarded the rebate payment as a program cost.[46] The Commission's guideline for the energy efficiency program cost-effectiveness evaluation is to use both the Program Administrator Costs (PAC) and Total Resource Costs (TRC) tests. The very stringent PAC test requires that the demand response benefits exceed the total cost of both the rebates paid out (including those paid to structural benefitors) and the program administrator's costs (including advertising). The 20% rebates in the 20/20 program weren't cost-based, and this contributed to the program not being cost effective. In addition, the existence of structural benefitors also significantly impaired the program's cost effectiveness.

Again, in this proceeding, SDG&E applied a TRC test for the whole AMI project, but did not provide a cost-effectiveness analysis for PTR. However, in contrast to the 20/20 program, SDG&E proposed PTR rebate credit based on the avoided capacity value used for the demand response benefit estimates. DRA advocates that any incentive credit should be cost-based. For the purpose of calculating a demand response benefit estimate, a PTR rebate credit should be based on the adopted avoided capacity value in this proceeding.[47] The Commission should use both PAC and TRC tests to evaluate the cost-effectiveness of SDG&E's proposed PTR program.

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[46] This report concluded that the 2005 statewide 20/20 program and SDG&E's 20/20 C&I program was not cost effective based on the Program Administrator's Cost test. Similar to PTR, the 20/20 program uses a baseline methodology, although it is defined differently than it is in the PTR program.

[47] SDG&E's proposed incentive credit of $0.65/kWh was below the maximum credit of $0.85/kWh based on its avoided capacity value of $85/kW-year (SDG&E's response to DRA's DR No. 23, Q.4). DRA is recommending $52/kW-year for the avoided capacity value in this testimony (Chapter 6). Accordingly, DRA's maximum incentive credit is $0.50/kWh.

E. Recommendation

Given the conclusions of the 20/20 report and the problems with the PTR baseline definition, it is doubtful that the PTR program would produce the level of demand response estimated by SDG&E. It is especially problematic that the 31% of customers whom DRA considers non-participants (see Figure 5-1) consume nearly half (42%) of the peak energy (see Figure 5-2). It is the peakier customers that a PTR program should attract, and yet it does not. If we could reflect this problem in the SPP model, the demand response would be even lower. A voluntary CPP tariff is not the solution to these problems because it will probably also not achieve high participation levels without enabling technology.

However, a rate design will not need to be implemented until 2009, three years from now. DRA recommends that the actual rate design not be litigated in this case but rather in SDG&E's next rate design window proceeding.[48] In that proceeding, the Commission can evaluate the pros and cons[49] of offering a PTR, a CPP rate design, or an alternative. If the Commission still wants to approve PTR in concept in this proceeding, DRA estimates the demand response benefits to be $38 million for 2009-2026. This estimate assumes DRA's participation rates, its recommendation to use a 17-year (2009-2026) AMI life cycle for the AMI business case instead of SDG&E's proposed 32 years, as discussed in Chapter 1 (Geilen), and its recommended capacity value of $52/kW-year instead of SDG&E's $85/kW-year, as discussed in Chapter 6 (Chan). These assumptions significantly impair the cost effectiveness of SDG&E's AMI proposal.

[48] In Chapter 14 of SDG&E's July amended testimony, SDG&E indicated that it has requested from the Commission leave to consolidate the Rate Design Window and General Rate Case, Phase 2 to be filed by June 1, 2007 (see p. RWH-2, Footnote No. 2).

[49] Including cost-effectiveness.

III. SMALL C&I RATE DESIGN AND PARTICIPATION ESTIMATES

As shown in its Table SSG 6-1, SDG&E assumes that the small C&I customers will be switched from their current seasonally differentiated flat rate to a mandatory default TOU rate starting in 2009.[50] In its July amended testimony, SDG&E also proposed to install programmable/controllable thermostats (PCT) for the participating small C&I customers and estimated up to 36% (41,500) of its small C&I customers with enabling technology by 2014.[51] The latest result from the SPP study indicates that the small C&I customers without enabling technology are not price responsive. Therefore, SDG&E assumes 100% of demand response benefits are attributed to the small C&I customers with PCT and Title 24 smart thermostats, and none from the non-PCT population.[52]

DRA agrees that the enabling technology is important as an effective tool to achieve demand response. SDG&E has shown that the demand response benefits from the PCT and associated costs are about equal.[53] However, DRA disagrees with SDG&E's assumption on the mandatory TOU rate for small C&I customers. SDG&E's testimony does not provide any justification or analysis to support its assumption of the mandatory rate change after AMI deployment.

In a rate design proceeding, many issues like AB 1X restrictions, customers' acceptance, and bill impacts must be addressed before the Commission can adopt a major change to customer's current rates. Given the results of the recent SPP study on C&I customers that showed that the small C&I customers are not price responsive at all, it is likely that there would be potential adverse bill impacts to many customers without this enabling technology, especially those in the hotter climate zones.

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[50] Also see SDG&E's July amended testimony, Chapter 5, p.MFG-17, lines 6-7 and Chapter 14, p.RWH-3, lines 4-19.

[51] SDG&E's response to DRA Data Request No. 40, Q.5.

[52] SDG&E's July amended testimony, p. SG-3, lines 5-16.

[53] SDG&E's' response DRA's Data Request No. 40, Q. 6.

Therefore, it is unreasonable to assume that the Commission will impose a mandatory TOU rate on these customers without addressing these issues. DRA does not advocate mandatory CPP or TOU for small C&I customers.

However, assuming voluntary TOU and PTR options, it is likely that the customers with enabling technology like SDG&E's proposed PCT would benefit from these rates and therefore would participate in these voluntary programs. Therefore, for the purpose of AMI business case, DRA accepts SDG&E's participation rate for small C&I customers for the demand response benefits estimates.

IV. MEDIUM AND LARGE C&I RATE DESIGN AND PARTICIPATION ESTIMATES

Similar to small C&I customers, as shown in its Table SSG 6-1, SDG&E also assumes that the medium C&I customers will still have the current TOU rate option until 2011. From 2011 and beyond, SDG&E assumes a mandatory CPP rate. For large C&I customers, their current TOU option will be eliminated in 2009 and replaced with a mandatory CPP rate. As shown in Table 5-1, SDG&E's participation rates reflect these assumptions.

Again, DRA disagrees with SDG&E's rate design assumptions for C&I customers. There is no evidence indicating that the Commission will eliminate the current TOU rates and make CPP mandatory. As shown in SDG&E's Tables 14-2 and 14-3, CPP and TOU rates are very different, as are the impacts to individual customers. SDG&E did not perform any bill impact or customer acceptance analysis regarding its illustrative mandatory CPP rate. Therefore, there is no justification for assuming a 100% participation on a CPP rate for medium C&I customers beyond 2010. As shown in Table 5-1, DRA uses a lower participation rate, which is the same for 2009 and 2010, based on the assumption that customers will continue to have a TOU rate option.

As for demand response benefits from large C&I customers, the bigger issue is whether demand response benefits from these customers should be credited to the AMI deployment, given most of the large C&I customers already have or will have

hourly interval meters prior to AMI deployment. SDG&E acknowledged that it "could implement default dynamic rates (CPP or other dynamic rate structure) with the current technology," SDG&E argues that because the communication technology (an old telephone system) with the current AB 29X meters must be replaced by 2011, regardless of the AMI deployment. Therefore, SDG&E counted these benefits starting from the AMI deployment (2009).[54] DRA has consulted with its technology consultant who sponsored Chapter 8 of this testimony (Hadden). In Mr. Hadden's opinion, given the speed of technology development in telecommunications, no one knows for sure exactly when SDG&E's current communication technology will no longer be supported by its vendor and will need to be replaced. There exists a range of judgments. SDG&E's judgment was 2011, which seems reasonable. DRA accepts SDG&E's assumption.

However DRA still disagrees that these benefits prior to 2011 should be credited to AMI. SDG&E stated that about 620 large C&I customers (about 36%[55]) didn't have an hourly interval meter as of late 2005.[56] SDG&E is in a process of completing the installation of the interval meters. Given the consideration that a few customers may not have an interval meter by AMI deployment, DRA uses a 5% participation rate for 2009 and 2010.

V. AVOIDED DEMAND RESPONSE PROGRAM COSTS

In its AMI business case, SDG&E included about $110 million[57] of cost savings, primarily based on three key assumptions: 1) all of SDG&E's day-ahead demand response programs will no longer be needed after AMI deployment; 2) a

[54] SDG&E's response to DRA's Data Request No. 28. DRA sent a follow up data request (No. 44) regarding the timing of the required changes to the AB 29X meters. DRA notes that SDG&E's response to Data Request No. 44 is inconsistent with the information in its response to the original question. DRA's analysis relies on SDG&E's response to the original question in Data Request No.28, which seems reasonable.

[55] = 620÷1,716.

[56] SDG&E's response to DRA's Data Request No. 28.

[57] Present value in 2000$ (see Table EF 2-2).

portion of the Technology Assistance and Incentive (TA/TI) costs will not be needed due to the success of these programs during the 2005-2008 cycle; and 3) the customer education, awareness, and outreach budget associated with the day-ahead programs will also not be needed. The avoided costs were based on SDG&E's 2008 budget.[58] As of June 2006, SDG&E's estimated contractual load reduction associated with these programs is 51.4 MW.[59] However, in its July Testimony, SDG&E only reduced the demand response reflecting the elimination of the day-ahead program by 11 MW. SDG&E explained that the 11 MW was based on the Working Group 2 (WG 2)'s most recent Monitory and Evaluation (M&E) report,[60] which reflected the actual load reduction as opposed to a contractual load reduction.

DRA does not object to SDG&E's three assumptions.[61] However, DRA found that SDG&E's methods in estimating the cost savings and load reduction were inconsistent. SDG&E estimated the cost savings based on the total authorized amount, rather than the recorded amount. On the other hand, it reduced the megawatts by the recorded amount, rather than the estimated amount when the budget was adopted. In 2005, SDG&E only spent 38% of its authorized budget on the day-ahead and TA/TI programs, and 62% was unspent. If only the recorded load reduction was used to reduce the total AMI demand response benefits estimates, SDG&E's program cost savings were overstated. Therefore, DRA adjusted

[58] D.06-03-024.

[59] Calculated based on the numbers shown in SDG&E's June 2006 Report on Interruptible and Outage Programs.

[60] Based on a telephone conversation between DRA and SDG&E's analyst on August 2, 2006.

[61] DRA notes that contrary to SDG&E's assumptions, Commissioner Peevy issued a ruling in SDG&E's Demand Response proceeding (A.05-06-017) on August 9, 2006. This ruling was issued in light of the heavy heat wave that California experienced in July 2006. In this ruling, the Commission seeks augmentations and improvements of SDG&E's Demand Bidding Program (DBP) and the 20/20 C&I program in 2007-2008 periods (see Attachment A of the ruling). DRA's position on this issue may change pending the Commission's decision in A.05-06-017. If this decision gives any indication regarding these program after 2008, SDG&E should not include any avoided demand response program costs in its AMI business case.

SDG&E's estimated cost savings for these programs by the 2005[62] unspent percentage (62%). The total avoided costs based on the 2008 budget for the day-ahead and TA/TI programs are about 72% of the total. Therefore, DRA recommends reducing it by 45%[63] ($50 million). DRA did not make any adjustment for customer education, awareness, and outreach cost savings because SDG&E has included similar costs in the AMI business case.

VI. CONCLUSIONS

For the reasons discussed above, DRA concludes that SDG&E's proposed and illustrative rate designs and participation rates are unrealistic. DRA recommends the Commission adopts DRA's assumptions as shown in Tables 5-2 and 5-3.

[62] The first year of the 2005-2008 budget cycles.

[63] = 72% x 62%.

TABLE 5-1

SDG&E's Participation Rates and Demand Response Benefits

(July 14, 2006 Amended Testimony)

Customer Segment	Participation Rates [1/]			Demand Response Benefits [2/]
	2009	2010	2011 & beyond	2009-2038
	(%)			(PV, Million)
Residential	70	70	70	$123.2
Small C&I [3/]	100	100	100	$14.2
Medium C&I [4/]	69	69	100	$62.7
Large C&I	100	100	100	$61.8
Total				**$261.9**

Notes:

1/ Prior to the adjustment for the meter deployment rate.

2/ Based on SDG&E's avoided capacity value of $85/kW-year and a $0.65/kWh of PTR credit for residential and small C&I.

3/ With enabling technology, 0% without enabling technology.

4/ Without enabling technology, 100% with enabling technology.

TABLE 5-2

DRA's Participation Rates and Demand Response Benefits

Customer Segment	Participation Rates [1/]			Demand Response Benefits	
				With DRA's Participation Rate	Recommended [2/]
	2009	2010	2011 & beyond	2009-2038	2009-2026
	(%)			(PV, Million)	
Residential	50	50	50	$87.2	$38.2
Small C&I [3/]	100	100	100	$14.2	$6.7
Medium C&I [4/]	69	69	69	$55.1	$25.8
Large C&I	5	5	69	$34.0	$25.2
Total				**$190.5**	**$96.0**

Notes:

1/ Prior to the adjustment for the meter deployment rate.

2/ Based on DRA's avoided capacity value of $52/kW-year and a $0.50/kWh of PTR credit for residential and small C&I.

3/ With enabling technology, 0% without enabling technology.

4/ Without enabling technology, 100% with enabling technology.

TABLE 5-3

Comparison of SDG&E's and DRA's CPP/TOU Rate Design Assumptions

Customer Segment	2009		2010		2011 & Beyond	
	SDG&E	DRA	SDG&E	DRA	SDG&E	DRA
Residential	PTR	PTR	PTR	PTR	PTR	PTR
Small C&I	Default TOU w/ PTR	Voluntary TOU w/ PTR	Default TOU w/ PTR	Voluntary TOU w/ PTR	Default TOU w/ PTR	Voluntary TOU w/ PTR
Medium C&I	Default CPP w/ TOU Opt-out Option	Default CPP w/ TOU Opt-out Option	Default CPP w/ TOU Opt-out Option	Default CPP w/ TOU Opt-out Option	Default CPP	Default CPP w/ TOU Opt-out Option
Large C&I	Default CPP	Default CPP w/ TOU Opt-out Option	Default CPP	Default CPP w/ TOU Opt-out Option	Default CPP	Default CPP w/ TOU Opt-out Option

TABLE 5-4

Comparison of Residential Demand Response (DR) Benefits

(2009 - 2026)

Scenarios	Rate Design Option		Present Value of DR Benefits	
			SDG&E [1/]	DRA
	2009-2013	2014-2026	($Million)	
Case A	**PTR**		**$123**	**$38**
Case B [2/]	**Voluntary CPP**		**$64**	**$28**
Case C [3/]	**PTR**	**Default CPP**	**$152**	**$51**

1/ As shown in SDG&E's updated Table 12 of its June Errata (SDG&E's response to DRA's Data Request No. 39).

2/ DRA's estimate reflects DRA's shorter AMI forecast period (17 yr. vs. 32 yr.) and lower capacity value ($52/kW-yr. vs. $85/kW-yr.)

3/ DRA's estimate reflects DRA's lower PTR participation rate, shorter AMI forecast period (17 yr. vs. 32 yr.) and lower capacity value ($52/kW-yr. vs. $85/kW-yr.)

TABLE 5-5

(REDACTED)

FIGURE 5-1
(REDACTED)

FIGURE 5-2
(REDACTED)

ATTACHMENT 5-1
(REDACTED)

ATTACHMENT 5-2

SDG&E'S RESPONSE TO DRA DATA REQUEST NO. 30

DRA DATA REQUEST NUMBER 30
A.05-03-015 – Requested Date June 16, 2006
SDG&E RESPONSE Dated June 30, 2006

Subject: Peak Time Rebate (PTR) Baseline Study and PTR Elasticity

Request No. 1: Based on the 5-day baseline and peak usage data in the Excel file, "SDG&EPTRBaselineRawData_v2.xls", which was provided by SDG&E in its response to DRA Data Request No. 20, it appears that a large percent (about 72%) of customer's average CPP usage over 13 CPP events is above their 5-day baseline. For about 32% of the customers, their average CPP usage is 15% above their 5-day baselines. This means that under SDG&E's proposed PTR program, 32% of customers would receive no payment if on average if they reduce load by 15% and the other 40% of the customers would receive only partial payments. Therefore, the incentives that customers receive do not accurately reflect their efforts in demand response. This would significantly affect a large group of customers' willingness to participate in the PTR.

Based on prior telephone meetings and conversations with SDG&E, DRA believes that SDG&E was aware the general issues of using a 5-day baseline and has explored various alternatives (e.g., adjusting the 5-day baseline, etc.). DRA assumes that SDG&E is aware of the above facts, if not, please confirm DRA's calculation. Please provide responses to the following:

A) Does SDG&E's estimated average load reduction presented in Chapter 6 reflect and make an adjustment to the above problem? If it does, provide a full explanation of how the SPP model used by SDG&E to estimate the average PTR load reduction reflects the above facts. Provide all of the supporting documents and workpapers. If it does not, explain the reason(s).

B) Referring to Chapter 6, page SSG-2, lines 21&22, Dr. George states that the participation rates and rate differences are the key inputs for demand response estimates.

1) DRA understands that the participation rates presented in Chapter 5 are based customers' awareness of the PTR program. The rate differences for the PTR are simply based on the 65 cent/kWh credit and the standard rates. Neither of these two inputs reflects the above facts, which is that 32% of the customers may not see the price signal at all. Please provide the correct answer(s) if DRA misunderstood SDG&E's testimony.

2) Is SDG&E planning to update its testimony and make changes to its SPP model or the inputs to the model for PTR demand response estimates to reflect the above facts? If the answer is yes, provide the date for the update filing. If the answer is no, please provide the reason(s).

3) Is it true that the SPP price elasticity model used in Chapter 6 was developed based on the traditional CPP rate design that customers pay higher rates during CPP events than their standard rates? Explain why the same model is applicable, without any adjustments, to demand response incentive programs like the PTR where customers do not pay higher rates than their standard rates during CPP events.

SDG&E Response 1:

A) The PTR rebate affects customer's bills but it does not directly affect the time-varying price signals that customers face. The impacts are modeled on the assumption that customers make their consumption decisions with the belief that they will be paid an additional $0.65/kWh for each kWh they reduce during the peak period, on top of the $0.149/kWh that they would also save on average for each kWh not consumed. To the extent that the baseline usage value is accurate (an impossibility since there is no way for anyone to know what a customer would have used in the absence of the rebate incentive), the marginal price signal times the difference between the baseline and actual usage will equal the bill savings. Any error in the estimate of baseline usage will affect the average rebate amount (either positively or negatively from the customer's perspective) but no customer can know this until the end of a billing period. Furthermore, the magnitude of any error will vary from month to month and could even be positive in one month and negative in another. Thus, it is impossible for a customer to accurately predict what the average rebate amount will be from one billing period to another and to factor that into their consumption decisions. As such, we believe that customers will base their consumption decisions on the marginal price signals inherent in the advertised kWh incentive, not on any attempt to estimate the actual incentive amount which can only be known after the fact.

Having said that, the actual incentive paid to a customer, which is a function of the baseline usage amount, may affect a customer's willingness to participate in future PTR events. That is, what customers are likely to do is make a judgment concerning whether the behavioral changes they have made in the past are worth the trouble based on the magnitude of the bill savings received.

SDG&E Response 1-Continued:

If the baseline value on average is too high, then the magnitude of bill savings will be smaller than it would be with a lower average baseline value and more customers may decide not to bother to respond to the PTR incentive in the future than would respond if the baseline value was biased in the other direction. That is, the reference value will, over time, affect participation rates.

In response to DRA20, Q2, SDG&E provided DRA with the results of analysis showing the average error for a wide variety of baseline calculation methods. This work was completed after the March 28th filing. In that memo, methods with average errors that are negative will produce lower bill rebate amounts than will methods with positive average errors. The method referenced in Chapter 6 of the filing, which relies on the five previous weekdays, has the largest negative average error of all the methods. After completing this analysis, SDG&E realized that this was probably not the best method to use when implementing the PTR program. In our July 7th supplemental filing, we plan to modify our discussion around this issue to indicate that we will ultimately choose a method that strikes a reasonable balance between accuracy, practicality and achieving sufficient bill reductions to maintain customer interst in continuing to reduce peak demand during future PTR events.

B1) Please see response to A).

B2) As explained in our response to A), the baseline calculation method does not affect the impact per customer but could, over time, affect participation levels. As also indicated, we will modify our discussion in the July 7th supplemental filing to reflect our plan to use a baseline method that achieves the proper balance between accuracy and practicality (e.g., ability to easily calculate bills) and that provides sufficient bill savings to achieve the desired participation levels.

B3) It is true that the SPP elasticities were used to estimate impacts for the PTR incentive program.